



The **topics** and **types of questions** examined in this Achievement Standard. Use this sheet to plan and organise your study so that you cover everything that is required.

**FREE DOWNLOADS:** For more of these Revision Checklists visit [www.studypass.co.nz](http://www.studypass.co.nz)

StudyPass

Copyright © 2009 Growing Minds Ltd.

NCEA Study Packs contain the past NCEA questions for all exams for each of these topics. Full answers, explanations and a set of summary course notes. View all titles at [www.studypass.co.nz](http://www.studypass.co.nz)



## 1.9 GEOMETRIC REASONING

AS 90153

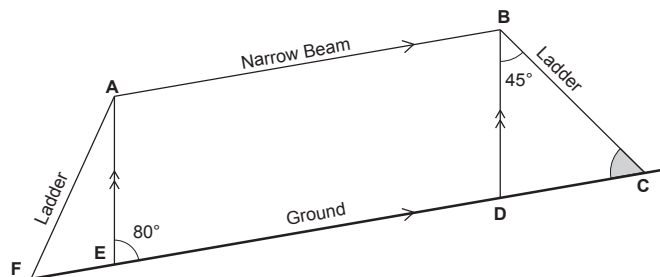
Use geometric reasoning to solve equations

### 1.9 1. Use geometric reasoning to solve problems

A

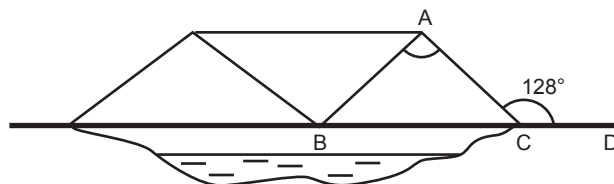
- problems involving a two-step process
- problems based on similar polygons, properties of polygons, parallel and intersecting lines

► The diagram below shows the *Narrow Beam Walk*.



It is built on sloping ground.  
The beam, **AB**, is parallel to the ground.  
The support posts, **AE** and **BD**, are vertical.  
The support post, **AE**, makes an angle of  $80^\circ$  with the ground.  
Find the angle **BCD**, the angle the ladder, **BC**, makes with the ground.

► A stream runs through Heta's farm.



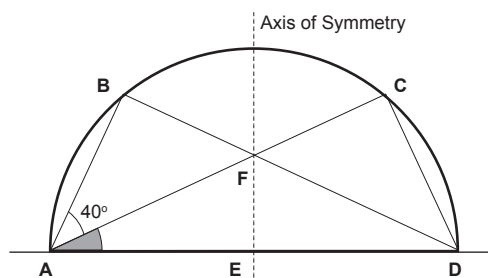
The diagram shows the side view of one bridge over the stream.  
**AB = AC**.  
Angle **ACD** =  $128^\circ$ .  
Calculate the size of angle **BAC**.

### 1.9 2. Use and state geometric reasons to solve problems

M

- problems involving at least a two-step process
- problems based on similar polygons, properties of polygons, parallel and intersecting lines, and circle geometry
- geometric reasons need to be stated

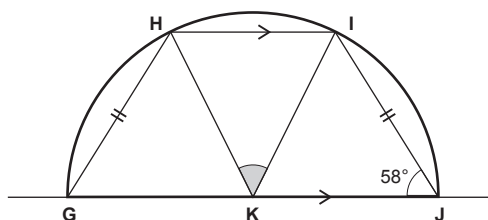
► (a) The end of a playground tunnel is a semicircle with the centre at **E**.



**EF** is an axis of symmetry.  
The tunnel is held up by bracing, as shown in the diagram.  
The brace **AC** makes an angle of  $40^\circ$  with the brace **AB**.

Find the angle **DAC**, the angle the brace **AC** makes with the ground. You **MUST** give geometric reasons for your answer.

(b) The bracing is different at the other end of the playground tunnel.



**K** is the centre of the semicircle.  
**GHIJ** is an isosceles trapezium, with **GJ** parallel to **HI**, as shown in the diagram. The brace **IJ** makes an angle of  $58^\circ$  with the ground.

Find the angle **HKI**, the angle between the two braces at **K**. You **MUST** give geometric reasons for your answer.

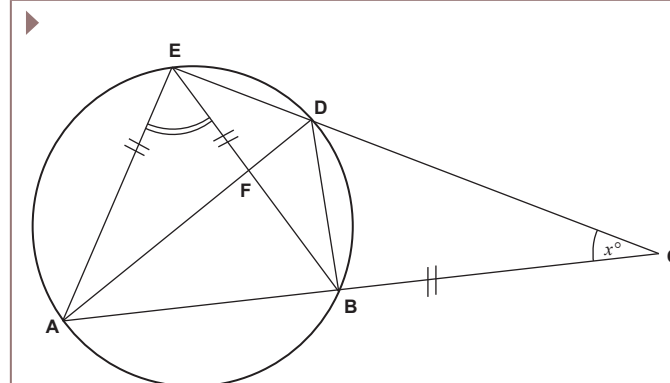
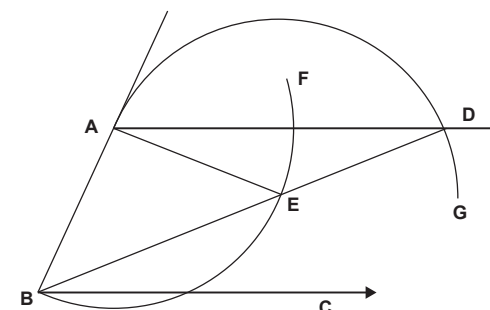
### 1.9 3. Solve an extended geometrical problem

E

- problems involving at least a three-step process
- problems may involve the presentation of a proof
- geometric reasons and linking statements are required

► In the figure below **AD** is parallel to **BC**.  
**A** is the centre of the arc **BEF**.  
**E** is the centre of the arc **ADG**.

Prove that angle **ABE** is twice the size of angle **CBE**.



In the above diagram, the points **A**, **B**, **D** and **E** lie on a circle.

**AE = BE = BC**. The lines **BE** and **AD** intersect at **F**.  
Angle **DCB** =  $x^\circ$ .

Find the size of angle **AEB** in terms of  $x$ . You must give a geometric reason for each step leading to your answer.